



Syllidae (Annelida: Phyllodocida) from Lizard Island, Great Barrier Reef, Australia

M. TERESA AGUADO¹*, ANNA MURRAY² & PAT HUTCHINGS²

¹*Departamento de Biología, Facultad de Ciencias, Universidad Autónoma de Madrid, Cantoblanco, 28049 Madrid, Spain.*

²*Australian Museum Research Institute, Australian Museum, 6 College Street, Sydney, NSW, 2010 Australia.*

*Corresponding author: maite.aguado@uam.es

Abstract

Thirty species of the family Syllidae (Annelida, Phyllodocida) from Lizard Island have been identified. Three subfamilies (Eusyllinae, Exogoninae and Syllinae) are represented, as well as the currently unassigned genera *Amblyosyllis* and *Westheidesyllis*. The genus *Trypanobia* (Imajima & Hartman 1964), formerly considered a subgenus of *Trypanosyllis*, is elevated to genus rank. Seventeen species are new reports for Queensland and two are new species. *Odontosyllis robustus* n. sp. is characterized by a robust body and distinct colour pattern in live specimens consisting of lateral reddish-brown pigmentation on several segments, and bidentate, short and distally broad falcigers. *Trypanobia cryptica* n. sp. is found in association with sponges and characterized by a distinctive bright red colouration in live specimens, and one kind of simple chaeta with a short basal spur.

Key words: Syllidae, Australia, taxonomy, new species

Introduction

The family Syllidae is one of the largest groups within Annelida in terms of the number of species. It is located within the clade Phyllodocida and part of Errantia (Weigert *et al.* 2014). Syllidae currently comprises 74 genera and more than 700 species (San Martín & Aguado 2014). The systematics of the family was reorganized by Aguado *et al.* (2012) based on a phylogenetic analysis including morphological and molecular information. The family is currently divided into five subfamilies: Anoplosyllinae, Eusyllinae, Exogoninae, Autolytinae and Syllinae, as well as several genera grouping outside these clades, such as *Anguillosyllis* Day, 1963, *Amblyosyllis* Grube, 1857, and *Perkinsyllis* San Martín, López & Aguado, 2009. Other genera are considered *incertae sedis*, such as *Westheidesyllis*, because they are not represented in any phylogenetic analyses including sequences of DNA (Aguado *et al.* 2012). *Westheidesyllis* was previously considered as part of Eusyllinae (San Martín *et al.* 2009).

Syllidae from Australia have been studied by several authors, among them Hartmann-Schröder (1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1989, 1990, 1991), and more recently by San Martín and others (San Martín 2002, 2005; San Martín & López 2003; San Martín & Hutchings 2006; San Martín *et al.* 2007, 2008a, 2008b, 2010). Some of these latter studies dealt with taxa that have been found only along the Australian coasts and whose evolutionary relationships within Syllidae are still enigmatic. Such is the case of the genera *Nooralia* San Martín, 2002, *Karroonsyllis* San Martín & López, 2003 and *Murrindisyllis* San Martín, Aguado & Murray, 2007.

Material and methods

The material examined was collected in August 2010 during a Census of Marine Life Coral Reef (CReefs) expedition and August 2013 during the Lizard Island Polychaete International Workshop, and is deposited in the

collections of the Australian Museum, Sydney (AM) and the Museum and Art Gallery Northern Territory, Darwin (NTM). Most of the specimens were directly preserved in 90% ethanol, although some were fixed in formalin and later preserved in 70% ethanol. All observations were made using a compound microscope with interference contrast optics (Nomarsky). Scanning Electron Microscope observations and photographs were made at the Australian Museum. One specimen of *Megasyllis heterosetosa* (Hartmann-Schröder 1991) was photographed by Chris Glasby (NTM) to check fluorescent properties (Fig. 5E). For this purpose, a Zeiss Discovery V8 Stereomicroscope was used, with an attached camera AxioCam Erc5s, Night Sea Stereomicroscope Fluorescence Adapters, Green excitation light (510–540 nm) and DsRed fluorophore (barrier filter) for lighting. Live specimens were photographed by Alexander Semenov with the camera equipment Canon 5d Mark II with Canon MP-E 1–5x Macro f2.8 lens + 2x Inon Z-240 Strobos; shots were made with ISO100, 1/200sec shutter speed, aperture—f13. Several segments of *Trypanobia cryptica* n. sp. and *T. depressa* were used to extract DNA and sequence the mitochondrial gene COI (GenBank reference herein) (for protocols see Aguado *et al.* 2015). Width of the specimens is measured at the level of proventricle, excluding parapodia.

For collection details of specimens collected during the 2013 (Aug–Sep) International Polychaete Workshop (MI QLD 2329–MI QLD 2449) see Ribas & Hutchings (2015). Collection details for other specimens are provided in full under Material examined sections for each species. Number of specimens under each registration number is one unless otherwise specified.

Results

In the present study we provide the identification of 30 species of Syllidae from Lizard Island, Queensland, collected in August, 2010 and August, 2013. The taxa are organized following the systematics proposed by Aguado *et al.* (2012). One new combination is proposed, 17 are new reports for Queensland, 24 for Lizard Island, and two are new species: *Odontosyllis robustus* n. sp. and *Trypanobia cryptica* n. sp. Other species not found during this study, but which have been previously reported (cited) from Lizard Island are:

Brevicirrosyllis ancori (San Martín & Hutchings, 2006) (see original reference)
Brevicirrosyllis mariae (San Martín & Hutchings, 2006) (see original reference)
Brevicirrosyllis mayteae (San Martín & Hutchings, 2006) (see original reference)
Clavisyllis yongei Watson, 2009 (see original reference)
Exogone arrakatakoola San Martín, 2005 (see original reference)
Exogone brevantennata Hartmann-Schröder, 1959 (see San Martín, 2005)
Exogone goorapuranga San Martín, 2005 (see original reference)
Paraexogone caribensis San Martín, 1991 (see San Martín, 2005)
Paraexogone patriciae San Martín, 2005 (see original reference)
Haplosyllis djiboutiensis (Gravier, 1900) (see Lattig, Martin & San Martín, 2010)
Sphaerosyllis densopapillata Hartmann-Schröder, 1979 (see San Martín, 2005)

Other species, although as yet unreported from Lizard Island, but also not found during this present study, nor the specimens examined, are also recorded in Australian museum collections as being collected from Lizard Island—see Ribas & Hutchings (2015). However, as we have not examined these specimens, and are uncertain of the reliability of the identifications, we are not including them herein.

Taxonomic account

Genus *Amblyosyllis* Grube, 1857

Amblyosyllis Grube, 1857: 186.

Type-species. *Amblyosyllis rhombeata* Grube, 1857, by monotypy.

***Amblyosyllis enigmatica* San Martín & Hutchings, 2006**

Amblyosyllis enigmatica San Martín & Hutchings, 2006: 261–262, figs 1A–C, 2A–E.

Material examined. AM W.44746, MI QLD 2391; AM W.44779, MI QLD 2395.

Remarks. As described by San Martín & Hutchings (2006), there are digitiform structures arising from cirrophores of chaetiger 6 onwards in an epigamic specimen AM W.44746. First report from Queensland.

Habitat. Algae and bryozoans, in intertidal and shallow waters.

Distribution. Australia (Western Australia, Queensland, New South Wales).

***Amblyosyllis* sp.**

(Fig. 1A)

Material examined. AM W.47194, MI QLD 2397.

Remarks. In live specimen, dorsal part of the body with a white, thick dorsal line, more discernible on posterior parapodia (Fig. 1A). Nuchal lappet long reaching chaetiger 2. Antennae, tentacular cirri and dorsal cirri with abundant granular material inside. Body, mainly dorsal cirri, covered by thin fibrillar secretions. Single specimen, not preserved well enough to be identified to species level.

Habitat. Sand, in shallow waters.

Distribution. Australia (Queensland).

Subfamily Eusyllinae Malaquin, 1893

Genus *Odontosyllis* Claparède, 1863

Odontosyllis Claparède, 1863: 47.

Type-species. *Syllis fulgurans* Audouin & Milne Edwards, 1833, designated by Hartman (1959).

***Odontosyllis australiensis* Hartmann-Schröder, 1979**

Odontosyllis australiensis Hartmann-Schröder, 1979: 95, figs 97–104.

Odontosyllis australiensis.—San Martín & Hutchings 2006: 284–286, figs 19C–F, 20A–H, 21A–F.

Material examined. AM W.44436, MI QLD 2371.

Remarks. *Odontosyllis australiensis* has possibly been previously recorded from Great Barrier Reef as *O. hyalina* by Monro (1931), but the specimens would have to be examined to confirm this.

Habitat. Dead coral, coarse sand and algae, in intertidal to shallow waters.

Distribution. Australia (Western Australia, Queensland, New South Wales).

***Odontosyllis detecta* Augener, 1913**

Odontosyllis detecta Augener, 1913: 236, pl. III, fig. 33, text-fig. 34.

Odontosyllis detecta.—San Martín & Hutchings 2006: 286–287, fig. 22A–C.

Material examined. AM W.44734, MI QLD 2387.

Remarks. The examined specimen is an epitoke. This species has been found in the west Pacific (Australia, Japan), though San Martín (1990) reported it from Cuba. The latter identification may need confirmation with more data (i.e. molecular information) in order to confirm the expansion of its distribution to the Atlantic Ocean. First report from Queensland.

Habitat. Sea grasses, sand and algae, in intertidal waters.

Distribution. Australia (Western Australia, Queensland, New South Wales, South Australia), Japan, Cuba (?).

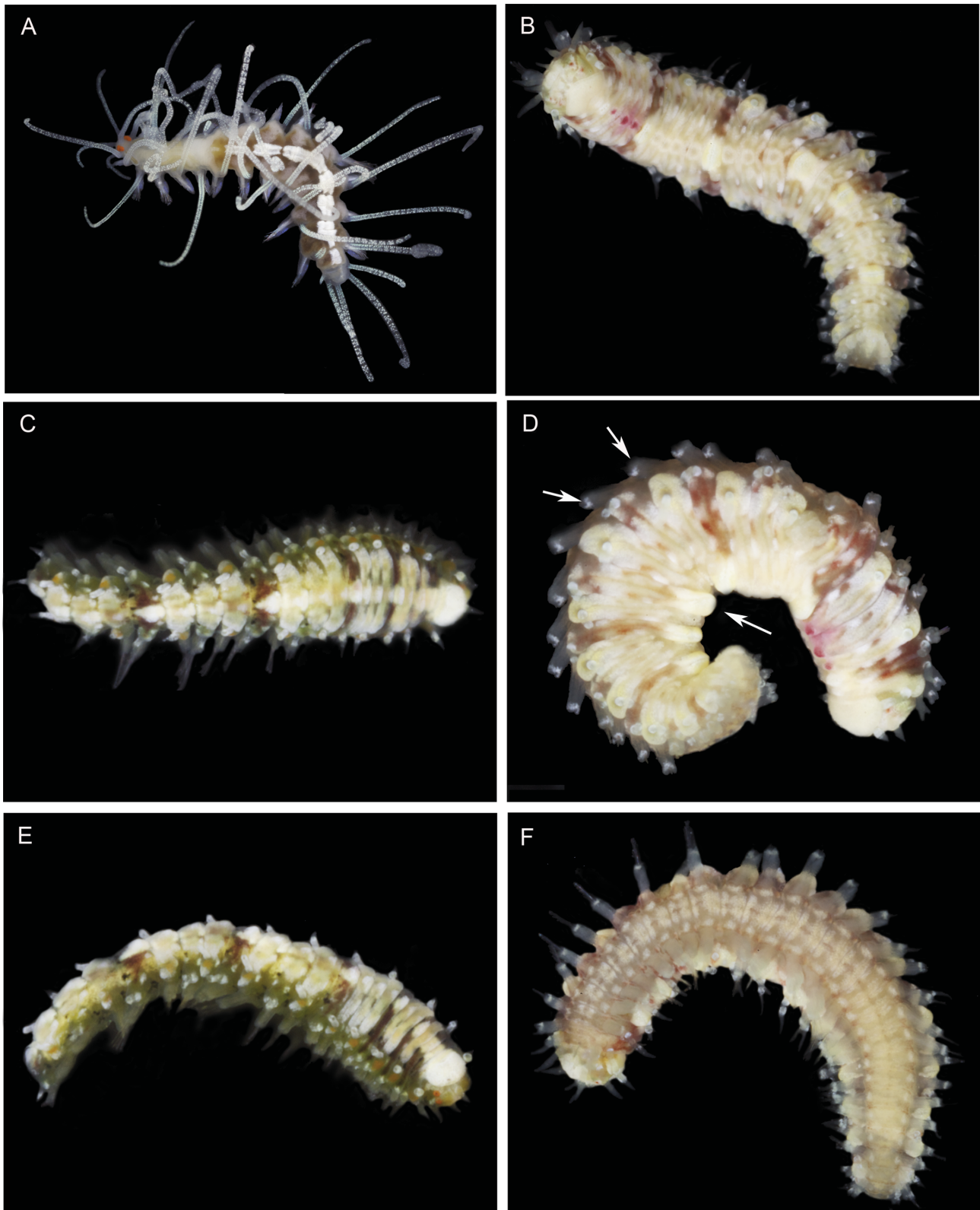


FIGURE 1. A. *Amblyosyllis* sp. AM W.47194, dorsal view; B. *Odontosyllis robustus* n. sp. AM W.44768, dorsal view; C. *Odontosyllis* sp. 1, AM W.47187, dorsal view; D. *Odontosyllis robustus* n. sp., lateral view, arrows pointing parapodia with a distal white ring and dorsal bump; E. *Odontosyllis* sp. 1, ventrolateral view; F. *Odontosyllis robustus* n. sp., ventral view.

Odontosyllis freycinetensis Augener, 1913

Odontosyllis freycinetensis Augener, 1913: 234, pl. II, fig. 7, text-fig. 33 a, b.

Odontosyllis freycinetensis.—San Martín & Hutchings 2006: 287–289, figs 23C–F, 24A–G, 25A–D.

Material examined. AM W.44782, MI QLD 2397; AM W.44738, MI QLD 2405; AM W.44076, MI QLD 2355; AM W.44786, MI QLD 2410 (3).

Remarks. Some specimens with wider posterior blades and shorter dorsal cirri and blades than those described by San Martín & Hutchings (2006). First report for Queensland.

Habitat. Dead coral, bryozoans and algae, in intertidal to shallow waters.

Distribution. Australia (Western Australia, Queensland, New South Wales).

Odontosyllis marombibooral San Martín & Hutchings, 2006

(Fig. 4)

Odontosyllis marombibooral San Martín & Hutchings, 2006: 297–298, figs 23A, B, 32A–C, 33A–F, 34A–E.

Material examined. AM W.44726; AM W.44739, MI QLD 2400; AM W.43859, MI QLD 2331; AM W.41672, MI QLD 2197, Queensland, Lizard Island, MacGillivray Reef, 14°39'23"S, 145°29'31"E, coral rubble, 22 m, 29 Aug 2010, CReefs; AM W.41674, Queensland, Lizard Island, MacGillivray Reef, 14°38'53"S, 145°29'12"E, coarse coral rubble, 14 m, 31 Aug 2010, CReefs.

Remarks. Distinct colour pattern as described by San Martín & Hutchings (2006) (Figs 4A–C). First report for Queensland.

Habitat. Sponges and dead coral, in intertidal to shallow waters.

Distribution. Australia (Western Australia, Queensland).

Odontosyllis robustus n. sp.

(Figs 1B, D, F, 2A–C, 3A–E)

Material examined. Holotype, AM W.44768, MI QLD 2380. Paratype, AM W.44755, MI QLD 2387 (1 on 2 SEM pins).

Description. Holotype, AM W.44768 is 5 mm long, 1.3 mm wide, with 29 chaetigers, adult specimen. Body broad and robust, dorsally spherical, ventrally flattened (Figs 1B, D, F). Live specimens with distinct colour pattern consisting of segments with and without lateral reddish-brown pigmentation. Colouration especially conspicuous in segments 2–3, 7–8, 13, 19, 23; all segments with a pair of reddish-brown spots laterally on dorsum; and chaetigers 4–6 each with one red spot in the midline of dorsum (Figs 1B, 2A). Some segments with dorsal bumps (Fig. 1D). Parapodia with distal white colouration (Figs 1D, F). Ventral colour pattern consisting of irregular red-brown pigment (Fig. 1D). Integument full of glandular material. Some segments and parapodia with fibrillar material arising from the surface. Prostomium wider than long, anterolaterally expanded, with two pairs of red eyes in trapezoidal arrangement, one pair of anterior eye spots (Fig. 2A). Antennae short and digitiform, lateral ones inserted on anterior margin of prostomium; middle antenna slightly posterior. Large white occipital flap semicircular, covering half of prostomium. Palps broad, shorter in length than prostomium. Peristomium shorter than subsequent segments. Tentacular cirri digitiform, anteriorly directed, longer than parapodia. Dorsal cirri of first chaetiger anteriorly directed. Subsequent dorsal cirri fusiform, slightly shorter than dorsal tentacular cirri, alternating in orientation up and down, those pointing up arising more dorsally from segment. Ventral cirri wide, shorter than parapodial lobes, proximally inserted. Parapodia rectangular in shape, with one rounded postchaetal lobe. Chaetal fascicle with approximately 20 compound heterogomph falcigers in midbody parapodia. Compound chaetae with bidentate blades, distal tooth minute, shorter than proximal one, distal blade edge with spines, blades exhibiting dorsoventral gradation in length (Figs 2B, 3A–E). Blades ~ 16 µm in length dorsally, ~ 10 µm in length ventrally on midbody. Anterior, midbody and posterior blades similar in length. Parapodia with one acicula, distally curved (Fig. 2C). Pharynx short, through approximately 5 segments in holotype, with 5 teeth directed backwards and two lateral plates. Proventricle through ~ 5 segments. Pygidium with two short anal cirri.

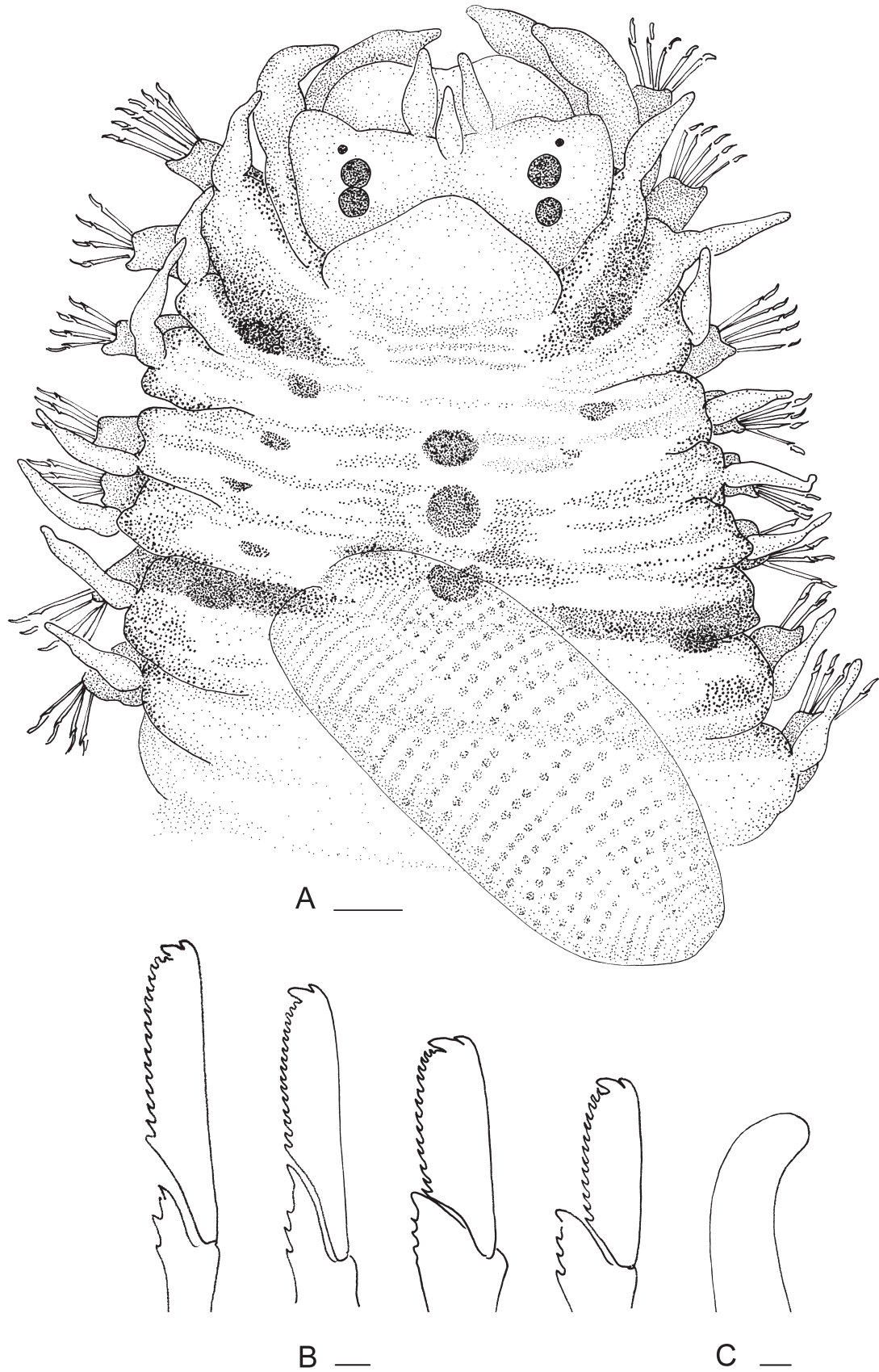


FIGURE 2. *Odontosyllis robustus* n. sp. AM W.44768; A. Anterior end, dorsal view; B. Mid-body chaetigers, bidentate chaetae; C. Acicula, posterior chaetiger. Scale bars: A= 0.1 mm; B, C = 2 μ m.

Remarks. The animals are quite broad and robust, with dorsal bumps and a distinct colour pattern. The chaetae are different to any described species. The species with the most similar chaetae is *O. freycinetensis*, which has unidentate blades; however, blades of *O. robustus* n. sp. are bidentate in all chaetigers, also shorter and distally wider.

Habitat. *Halimeda* algae, in shallow waters.

Distribution. Australia (Queensland).

Etymology. The name comes from the Latin word “*robustus*” and refers to the robust body shape of this animal.

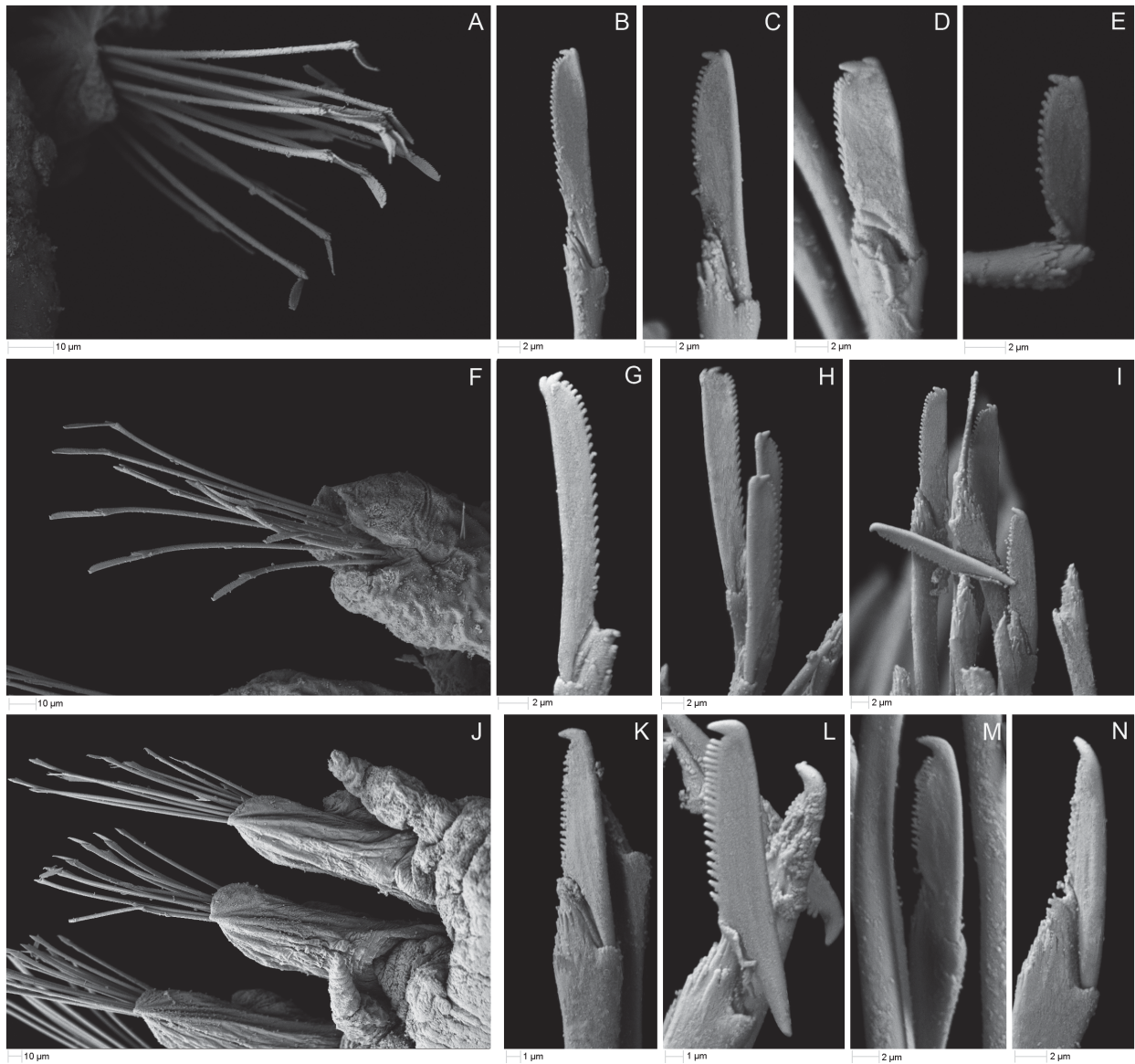


FIGURE 3. SEM, *Odontosyllis robustus* n. sp. AM W.44755. A. Anterior chaetiger, lateral view; B–D. anterior to mid-body chaetae; E. Posterior chaeta. SEM *Odontosyllis* sp. 1 AM W.47187. F. Anterior chaetiger, ventral view; G–I. Anterior chaetae; J. Mid-body chaetiger; K–N. Mid-body and posterior chaetae.

Odontosyllis sp. 1

(Figs 1C, E, 3F–N)

Material examined. AM W.47187, MI QLD 2380 (1 on 2 SEM pins).

Remarks. This specimen has anterior chaetigers with bidentate chaetae, with a minute distal tooth, similar to those of *O. robustus* n. sp. (Figs 3F–I). However, middle and posterior chaetigers also show unidentate chaetae,

similar in shape to those of *O. globulocirrata* Hartmann-Schröder, 1981 (Figs 3J–N). It has a similar colour pattern to *O. robustus* n. sp. but with orange spots on alternating parapodia, at the base of dorsal cirri (Figs 1C, E). First report from Queensland.

Habitat. *Halimeda* algae, in shallow waters.

Distribution. Australia (Queensland).

Odontosyllis sp. 2

Material examined. AM W.44095, MI QLD 2346, on SEM pin.

Remarks. This specimen has a broad and wide body, robust and circular in section. It has a distinct colour pattern consisting of a double dark transverse line on the sixth chaetiger and red spots on the dorsal midline of each segment. Dorsum of anterior segments and some parapodia with fibrillar material arising from the surface. The chaetae and aciculae are similar to those of *O. freycinetensis*. Body shape and dorsal cirri similar to those of *Odontosyllis robustus* n. sp.

Habitat. Sand, in shallow waters.

Distribution. Australia (Queensland).

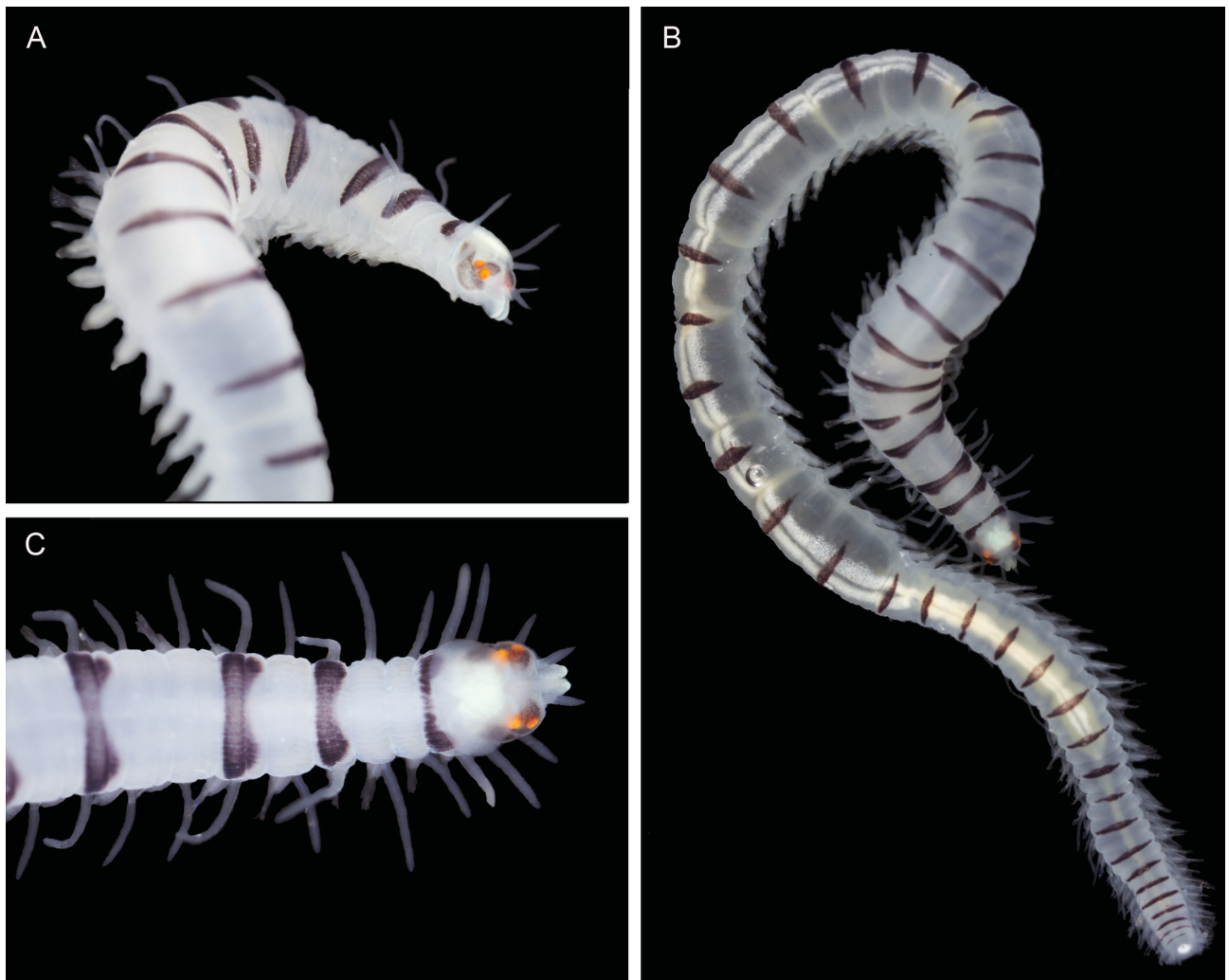


FIGURE 4. A. *Odontosyllis marombibooral* AM W.43859, ventrolateral view; B–C. *Odontosyllis marombibooral*, dorsal view, AM W.43859.

Genus *Opisthodonta* Langerhans, 1879

Opisthodonta San Martín, López & Aguado, 2009: 1472–1473.

Type-species. *Opisthodonta morena* Langerhans, 1879, by monotypy.

Opisthodonta rousei (San Martín & Hutchings, 2006)

Pionosyllis rousei San Martín & Hutchings, 2006: 345–346, fig. 74A–F.

Opisthodonta rousei.—San Martín, López & Aguado, 2009: 1474.

Material examined. AM W.44751, MI QLD 2395; AM W.45008, MI QLD 2424.

Remarks. First report from Queensland.

Habitat. Coral rubble and sand, in shallow, subtidal waters to 244 m depth (San Martín & Hutchings 2006).

Distribution. Tasman Sea, Australia (Queensland).

Subfamily Exogoninae Langerhans, 1879

Genus *Erinaceusyllis* San Martín, 2005

Erinaceusyllis San Martín 2005: 73.

Type-species. *Sphaerosyllis erinaceus* Claparède, 1863, designated by San Martín, 2005.

Erinaceusyllis hartmannschroederiae San Martín, 2005

Erinaceusyllis hartmannschroederiae San Martín, 2005: 82–83, figs 38A–I, 39A–F.

Material examined. AM W.43994, MI QLD 2334.

Habitat. All kind of substrates, in intertidal to shallow waters. First report for Lizard Island.

Distribution. Australia (all states).

Genus *Exogone* Örsted, 1845

Exogone Örsted, 1845: 20.

Type species. *Exogone naidina* Örsted, 1845, designated by Hartman (1959).

Exogone africana Hartmann-Schröder, 1974

(Fig. 5A)

Exogone verugera africana Hartmann-Schröder, 1974a: 137, figs 164–168.

Exogone (Exogone) africana.—San Martín 2005: 143–145, figs 90A–I, 91A–E; Çinar & Dagli 2012: 105–106, fig. 3.

Material examined. AM W.45201, MI QLD 2437.

Remarks. Specimen with brooding eggs, with natatory chaetae (Fig. 5A). San Martín (2005) includes in the diagnosis of *Exogone* that mature females carry eggs ventrally, and lack capillary notochaetae (natatory chaetae), which are, in contrast, present in mature males. However, this specimen is clearly a female brooding eggs ventrally and possesses natatory chaetae in midbody segments.

Habitat. All kinds of substrates, in intertidal to shallow waters.

Distribution. Angola, Namibia, Hawaii, Japan, Australia (all states), Mediterranean (alien species).

Genus *Prosphaerosyllis* San Martín, 1984

Sphaerosyllis (*Prosphaerosyllis*) San Martín, 1984: 377.

Type species. *Sphaerosyllis xarifae* Hartmann-Schröder, 1960, by monotypy.

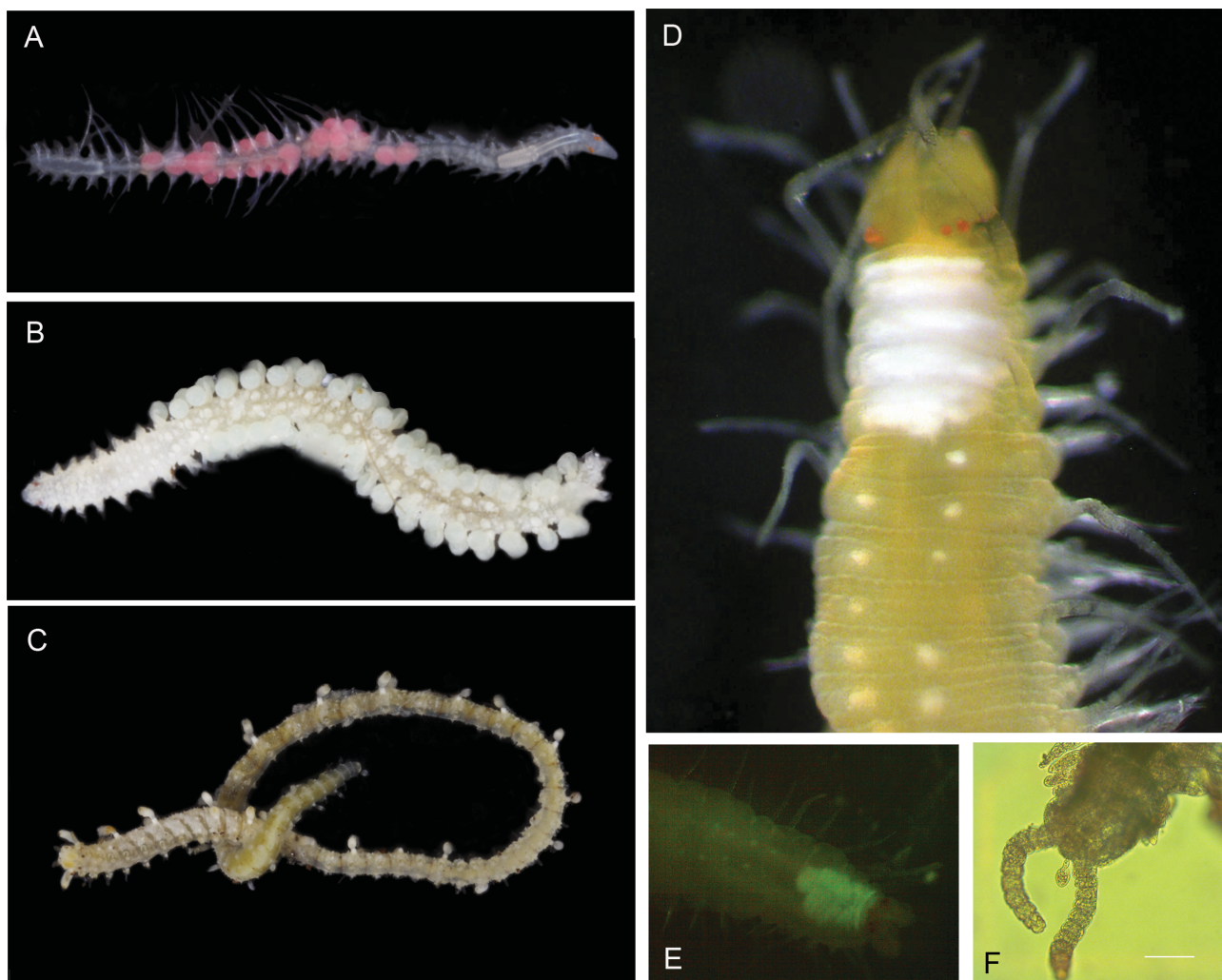


FIGURE 5. A. *Exogone africana* AM W.45201, dorsal view; B. *Prosphaerosyllis longipapillata* AM W.45202, dorsal view; C. *Paraopisthosyllis phyllocirra* AM W.44771, dorsal view; D. *Megasyllis heterosetosa* AM W.44780, dorsal view; E. *Megasyllis heterosetosa* under fluorescent green light, dorsal view; F. *Parasphaerosyllis indica* AM W.44422, pygidium, dorsal view. Scale bars: F = 50 μ m.

***Prosphaerosyllis longipapillata* (Hartmann-Schröder, 1979)** (Fig. 5B)

Sphaerosyllis longipapillata Hartmann-Schröder, 1979: 106, figs 148–150.

Sphaerosyllis longipapillata.—Çinar *et al.* 2003: 757–759, fig. 5.

Prosphaerosyllis longipapillata.—San Martín 2005: 61–64, figs 17A–G, 18A–H.

Material examined. AM W.44995, MI QLD 2433; AM W.44994, MI QLD 2437; AM W.44985, MI QLD 2437; AM W.44993, MI QLD 2433; AM W.44717, MI QLD 2379; AM W.44787, MI QLD 2391; AM W.43860, MI QLD 2329; AM W.44099, MI QLD 2340; AM W.45202, MI QLD 2437.

Remarks. Specimen AM W.45202 is brooding eggs dorsally in two rows, two pairs per segment (Fig. 5B). Specimen AM W.44787 is epigamic. Some specimens possess dorsal cirri longer than those described by San Martín (2005). First report for Lizard Island.

Habitat. All kind of substrates, from intertidal to 466 m depth (San Martín, 2005).

Distribution. Australia (all states), Mediterranean (alien species).

Subfamily Syllinae Grube, 1850

Genus *Branchiosyllis* Ehlers, 1887

Branchiosyllis Ehlers, 1887: 148.

Type-species. *Branchiosyllis oculata* Ehlers, 1887, by monotypy.

Branchiosyllis australis Hartmann-Schröder, 1981

Branchiosyllis pacifica australis Hartmann-Schröder, 1981: 23, figs 14–18.

Branchiosyllis oculata.—Non Ehlers, 1887; San Martín *et al.* 2008a: 134, figs 12A–E, 13C–F, 15A.

Branchiosyllis australis.—Álvarez *et al.* 2012: 55–56, figs 1A, C, E.

Material examined. AM W.41592, Queensland, Lizard Island, south of Mermaid Cove, 14°38'53"S, 145°27'E, coarse coral rubble, 14.5 m, 1 Sep 2010, CReefs.

Remarks. First report for Queensland.

Habitat. Sponges, coral rubble and algae. Shallow waters.

Distribution. Philippines, Australia (north Western Australia, Queensland).

Branchiosyllis baringabooreen San Martín, Hutchings & Aguado, 2008

Branchiosyllis baringabooreen San Martín *et al.*, 2008a: 122–123, figs 1A–D, 2A–E.

Material examined. AM W.41623, Queensland, Lizard Island, Watson's Bay, 14°39'30"S, 145°26'56"E, sand, 9 m, 30 Aug 2010, CReefs.

Remarks. First report for Queensland.

Habitat. Sand and coral rubble, in intertidal to shallow waters.

Distribution. Australia (north Western Australia, Queensland).

Branchiosyllis thylacine San Martín, Hutchings & Aguado, 2008

Branchiosyllis thylacine San Martín *et al.*, 2008a: 137–140, figs 16 A–G.

Material examined. AM W.41616, Queensland, Yonge Reef, 14°34'40"S, 145°37'E, coarse coral rubble, 8 m, 10 Sep 2010, CReefs.

Remarks. First report for Queensland.

Habitat. Sponges, ascidians and bryozoans, shallow waters.

Distribution. Australia (Queensland, New South Wales).

Branchiosyllis verruculosa (Augener, 1913)

Syllis (*Typosyllis*) *verruculosa* Augener, 1913: 203, text-fig. 24a–c, pl. 3, fig. 39.

Branchiosyllis verruculosa.—Licher 1999: 274; Aguado *et al.* 2008: 13, fig. 5; San Martín *et al.* 2008a: 140–141, figs 17A–F, 18A–F, 19A–D.

Material examined. AM W.44741, MI QLD 2398; AM W.44773, MI QLD 2387; AM W.44729, MI QLD 2379; AM W.44709, MI QLD 2398.

Remarks. Live specimens with dark transverse bands on some anterior segments more distinct than those described from preserved material by San Martín *et al.* (2008a). First report for Lizard Island.

Habitat. Rocks, dead coral and algae, in intertidal to subtidal depths.

Distribution. Australia (central Western Australia, Queensland, South Australia), Indonesia.

Genus *Eurysyllis* Ehlers, 1864

Eurysyllis Ehlers, 1864: 264.

Type species. *Eurysyllis tuberculata* Ehlers, 1864, by monotypy.

Eurysyllis tuberculata Ehlers, 1864

Eurysyllis tuberculata Ehlers, 1864: 264, figs 4–7.

Eurysyllis tuberculata.—San Martín *et al.* 2008a: 141–144, fig. 20.

Material examined. AM W.44774, MI QLD 2393; AM W.44756, MI QLD 2390.

Remarks. First report for Queensland. *Eurysyllis tuberculata* may represent a complex of species with indistinguishable morphological features.

Habitat. Dead coral, sponges and algae, in intertidal to subtidal depths.

Distribution. Australia (Western Australia, Queensland, New South Wales, Tasman Sea, South Australia), Mediterranean, Red Sea, Eastern Atlantic (North Sea to Canary Islands), Western Atlantic (North Carolina, USA to Gulf of México).

Genus *Megasyllis* San Martín, Hutchings & Aguado, 2008

Megasyllis San Martín *et al.* 2008b: 5–6.

Type species. *Syllis corruscans* Haswell, 1885, by monotypy.

Megasyllis heterosetosa (Hartmann-Schröder, 1991)

(Figs 5D–E)

Typosyllis (*Typosyllis*) *heterosetosa* Hartmann-Schröder, 1991: 30, figs 30–35.

Megasyllis heterosetosa.—San Martín *et al.* 2008b: 8, figs 9A–F, 10A–E; 2014: 341.

Material examined. AM W.44780, MI QLD 2400.

Remarks. Live specimen bright yellow, similar colour pattern to *M. inflata* (Marenzeller, 1879) (Fig. 5D). Some photographs taken by Paul Human of live specimens from Australia have been identified as *M. corruscans* (Haswell, 1885) and *M. inflata* by Aguado & Glasby (2015). These species and also *M. heterosetosa*, as shown herein (Fig. 5D), have a white area on the dorsum of first segments. In these photos, this white area appears to reflect green light. In order to check possible fluorescence properties of *Megasyllis* species, this specimen from Lizard Island was subjected to fluorescent green light. However, it did not reflect any extra light (Fig. 5E). Considering this negative result, we can conclude that the green bright light seen in photos of live specimens is possibly due to an optical artefact. First report for Lizard Island.

Habitat. Coralline and muddy sand and sea grasses, in intertidal to subtidal depths.

Distribution. Australia (Queensland, New South Wales), Japan.

Genus *Opisthosyllis* Langerhans, 1879

Opisthosyllis Langerhans, 1879: 541.

Type species. *Opisthosyllis brunnea* Langerhans, 1879, designated by Hartman (1959).

Opisthosyllis viridis Langerhans, 1879

Opisthosyllis viridis.—Imajima 1966b: 224, fig. 39; Lee & Rho 1994: 135, fig. 3; San Martín *et al.* 2008b: 35–39, figs 26E, F, 27A–G, 28A–F, 29A, B.

Material examined. AM W.45002, MI QLD 2424; AM W.44732, MI QLD 2400.

Remarks. *Opisthosyllis viridis* may represent a complex of species. Specimens from Japan, Korea and Australia (Imajima 1966b; Lee & Rho 1994; San Martín *et al.* 2008b) have posterior chaetae with a minute proximal tooth, gradually becoming almost unidentate. However, specimens from Cabo Verde and Canary Islands (López & San Martín 1994; Núñez *et al.* 1992) maintain bidentate blades along the whole body length. Additionally, specimens from the Pacific have longer dorsal cirri and posteriorly chaetal shafts become wider. However, the type specimens from Madeira are lost. It was previously reported from Lizard Island by San Martín *et al.* (2008b).

Habitat. Dead coral, sea grasses, rubble sediment and algae, in intertidal to shallow waters.

Distribution. Japan, Korea, Australia (Western Australia, Queensland, New South Wales).

Genus *Paraopisthosyllis* Hartmann-Schröder, 1991

Paraopisthosyllis Hartmann-Schröder, 1991: 27.

Type species. *Opisthosyllis brevicirra* Hartmann-Schröder, 1979, by monotypy.

Paraopisthosyllis phyllocirra Hartmann-Schröder, 1991

(Figs 5C, 6)

Paraopisthosyllis phyllocirra Hartmann-Schröder, 1991: 27, figs 26–29.

Paraopisthosyllis phyllocirra.—San Martín & Hutchings 2006: 322, figs 55A–F.

Material examined. AM W.44766, MI QLD 2399; AM W.44740, MI QLD 2400, on SEM; AM W.44771, MI QLD 2395.

Description. Longest specimen 5 mm long, approximately 50 chaetigers, some red-brown spots dorsally and laterally and one transverse line per segment of same colour. Dorsal and ventral surfaces covered by numerous, scattered, rounded papillae (Figs 6A–B). Prostomium oval, 4 eyes arranged in open trapezoidal pattern; lateral antennae inserted near anterior margin, median antenna similar to lateral. Palps folded ventrally (Fig. 6A). Peristomium slightly shorter than subsequent segments; tentacular cirri similar, thicker and larger than antennae (Fig. 6B). Dorsal cirri inflated, alternating in position between laterodorsal and lateral (Fig. 5C); laterodorsally located ones large and inflated, while those arising more laterally smaller and less inflated (Figs 6A–C). Parapodia sub-rectangular, with several distal papillae. Anterior parapodia with 8–12 compound, heterogomph chaetae with long curved, bidentate blades, with dorsoventral gradation in length of blades within fascicle (Figs 6D–E). Midbody and posterior parapodia with 7–10 compound chaetae similar in shape, but with shorter blades, all of same length or with slight dorsoventral gradation in length within fascicle (Figs 6F–I). Posterior parapodia with one dorsal unidentate simple chaeta, and one ventral bidentate sigmoid simple chaeta. Anterior parapodia with 3 aciculae, distally rounded, some distally curved; 1–2 aciculae on posterior parapodia. Pharynx wide, through 5 segments; pharyngeal tooth set back from anterior ring of the pharynx. Proventricle large, through 5 segments.

Remarks. The shape of the dorsal and ventral simple chaetae was not properly described in previous descriptions. Dorsal cirri are not leaf-shaped, as previously described for the holotype, an artefact possibly caused by distortion due to mounting the type specimen on a slide for examination by compound microscopy. First report for Lizard Island.

Habitat. Coralline sand, intertidally.

Distribution. Australia (Queensland).

Paraopisthosyllis pardus Aguado & Glasby, 2015

Paraopisthosyllis pardus Aguado & Glasby, 2015: 10–14, figs 18–25.

Material examined. Paratype: AM W.45011, MI QLD 2424.

Habitat. Coral rubble, in shallow subtidal depths.

Distribution. Australia (Queensland).

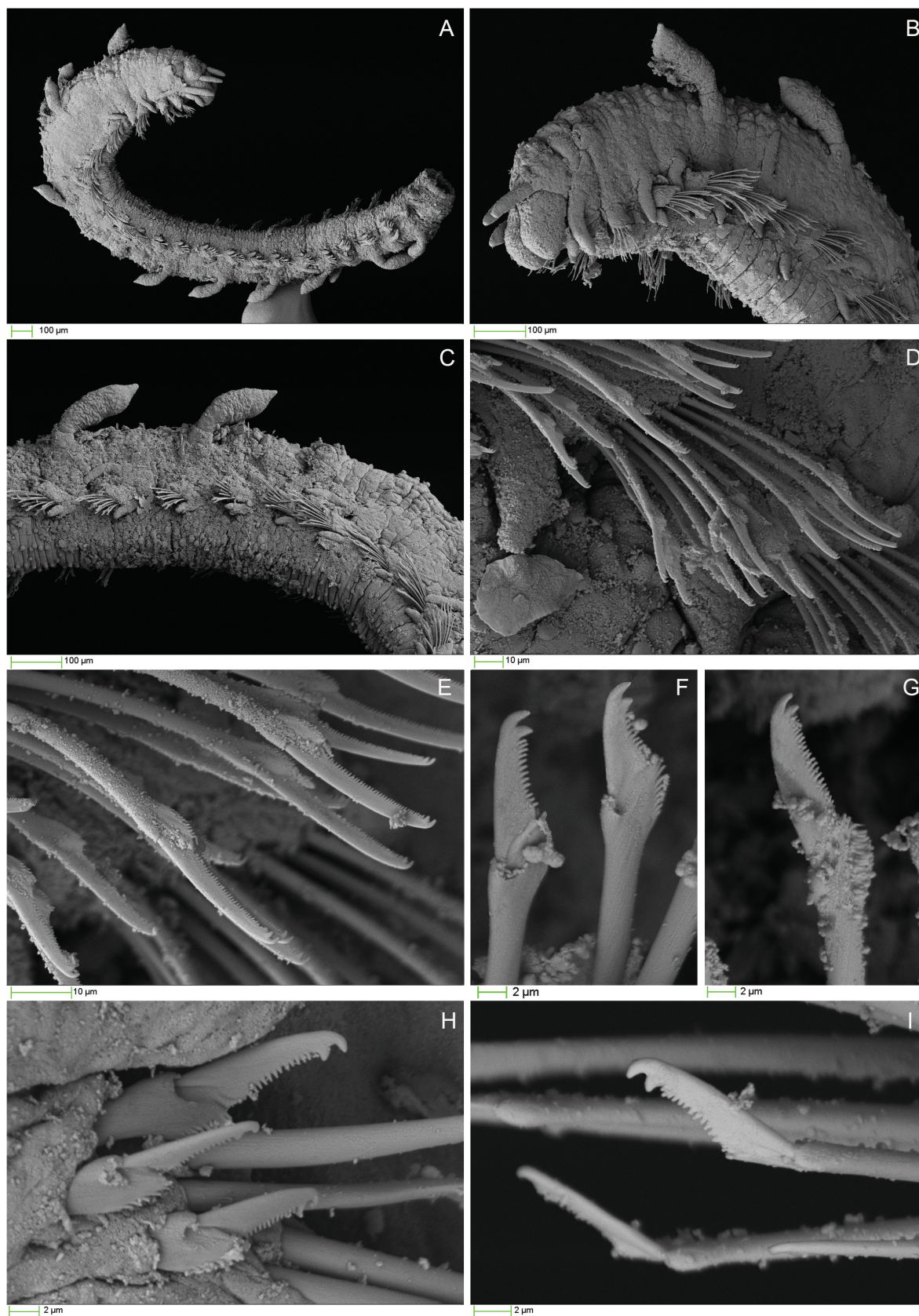


FIGURE 6. SEM. *Paraopisthosyllis phyllocirra* AM W.44740. A. Anterior end, lateral view; B. Detail, anterior end, lateral view; C. Mid-body segments, lateral view; D. Anterior chaetiger; E. Anterior chaetae; F–G. Mid-body chaetae; H–I. Posterior chaetae.

Genus *Parasphaerosyllis* Monro, 1937

Parasphaerosyllis Monro, 1937: 273.

Type species. *Parasphaerosyllis indica* Monro, 1937, by monotypy.

Parasphaerosyllis indica Monro, 1937

(Fig. 5F)

Parasphaerosyllis indica Monro, 1937: 273, text-fig. 8.

Parasphaerosyllis indica.—Westheide 1974: 64, figs 27–29; San Martín *et al.* 2008a: 146–147, figs 19E–F, 22A–E, 24A–B.

Material examined. AM W.44422, MI QLD 2371; AM W.43851, MI QLD 2331 (2); AM W.43861, MI QLD 2329.

Remarks. Antennae longer than those described by San Martín *et al.* (2008). Anal papilla inflated, similar to spherical dorsal cirri (Fig. 5F). It was reported from Queensland but may represent a complex of species. First report for Lizard Island.

Habitat. Dead coral and algae, in intertidal to shallow waters.

Distribution. Circum-tropical to temperate waters, Australia (Western Australia, Queensland, New South Wales, Victoria).

Genus *Plakosyllis* Hartmann-Schröder, 1956

Plakosyllis Hartmann-Schröder, 1956: 87.

Type species. *Plakosyllis brevipes* Hartmann-Schröder, 1956, by monotypy.

Plakosyllis brevipes Hartmann-Schröder, 1956

Plakosyllis brevipes Hartmann-Schröder, 1956: 87, figs 1–8.

Plakosyllis brevipes.—San Martín 2008a: 148, figs 23A–D, 24C, D.

Material examined. NTM W025612, Lizard Island, CW4015 8770, CReefs, 2009.

Remarks. First report for Queensland. *Plakosyllis brevipes* may represent a complex of species with indistinguishable morphological features.

Habitat. Sand, sea grasses, sponges and algae, in intertidal to subtidal depths.

Distribution. Mediterranean Sea, NE and NW Atlantic Ocean, Red Sea, Indian Ocean, New Caledonia, Australia (Western Australia, Queensland, New South Wales).

Genus *Trypanosyllis* Claparède, 1864

Trypanosyllis Claparède, 1864: 558.

Type species. *Syllis zebra* Claparède, 1864, by monotypy.

Remarks. As previous authors have noted (Çinar 2007) and previous phylogenetic hypotheses suggested (Aguado *et al.* 2012, 2015), the genus *Trypanosyllis* is in need of revision.

Trypanosyllis sp. 1

(Figs 7A–E)

Material examined. AM W.44085, MI QLD 2352.

Remarks. This incomplete specimen possesses morphological similarities with *Trypanosyllis aeolis* Langerhans, 1879, from Australia (San Martín *et al.* 2008b), especially in the shape of the chaetae and aciculae

(Figs 7B–E). However, *T. aeolis* from Australia was described with a pale body and brown dorsal cirri, while the live specimen shown herein has a colouration consisting of three thin red transverse lines per segment, and bright orange distal tips of the dorsal cirri (Fig. 7A). Preservation processes might explain these differences in the colour pattern, since San Martín *et al.* (2008b) described the species from preserved specimens. However, as only one anterior end was found from Lizard Island, we cannot conclude if this specimen completely agrees with *T. aeolis* and hereby refer to it as *Trypanosyllis* sp. until more complete specimens are available.

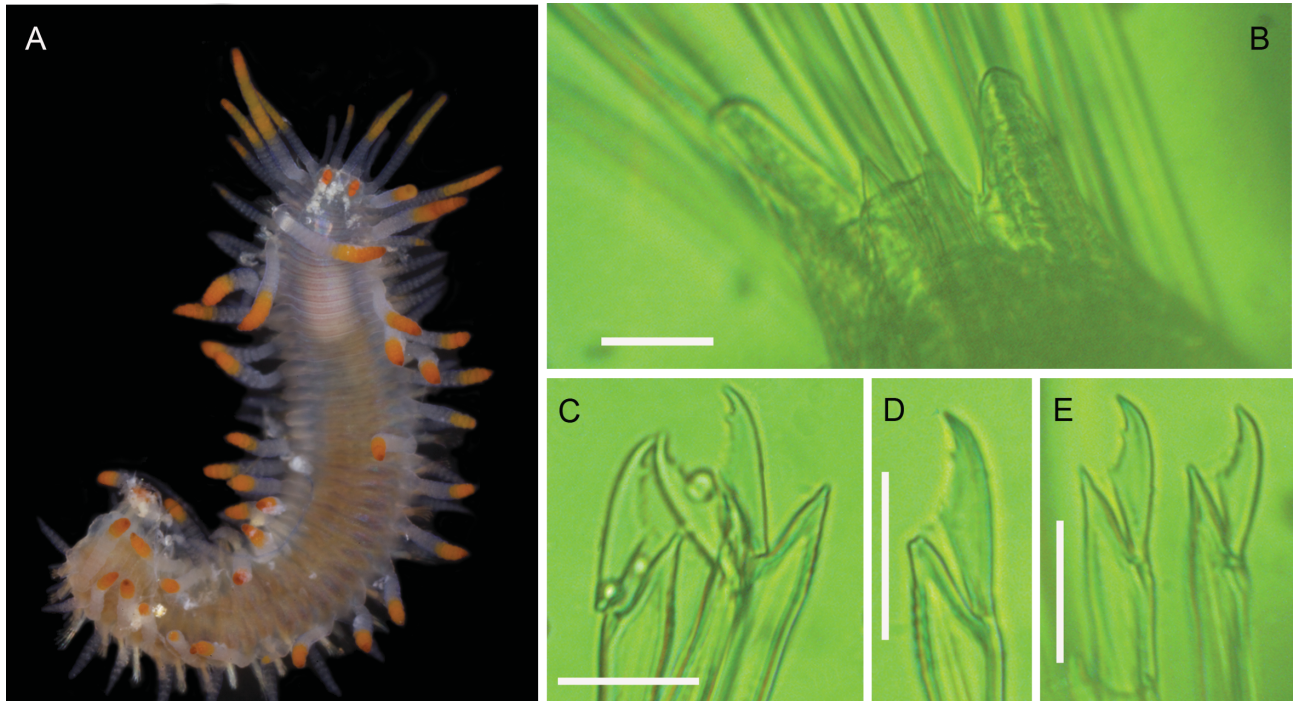


FIGURE 7. *Trypanosyllis* sp. 1 AM W.44085. A. Dorsal view; B. Mid-body aciculae; C–E. Mid-body chaetae. Scale bars: B–E = 20 μ m.

Habitat. Dead coral, sponges and algae, in intertidal to shallow waters.

Distribution. Australia (Queensland).

Trypanosyllis sp. 2

(Fig. 8)

Material examined. AM W.41641, Queensland, Lizard Island, MacGillivray Reef, 14°38'53"S, 145°29'12"E, coarse coral rubble, 14 m, 31 Aug 2010, CReefs.

Remarks. Specimen with several thin red transverse lines per segment; papillae and tufts of cilia on dorsum and on parapodia (Figs 8A–C, F). This specimen is similar to *Trypanosyllis zebra* (Grube, 1860) from Australia, described by San Martín & Hutchings (2006), with dorsal papillae, though these authors did not mention dorsal tufts of cilia. Dorsal chaetae are similar in both species (Fig. 8E); however, most ventral chaetae in *Trypanosyllis* sp. are weakly bidentate (Fig. 8G), or completely unidentate (Fig. 8H), while in *T. zebra* all chaetae are bidentate. In addition, *T. zebra* is widely distributed and probably represents a complex of sibling species.

Habitat. Coral rubble at 14 m depth.

Distribution. Australia (Queensland).

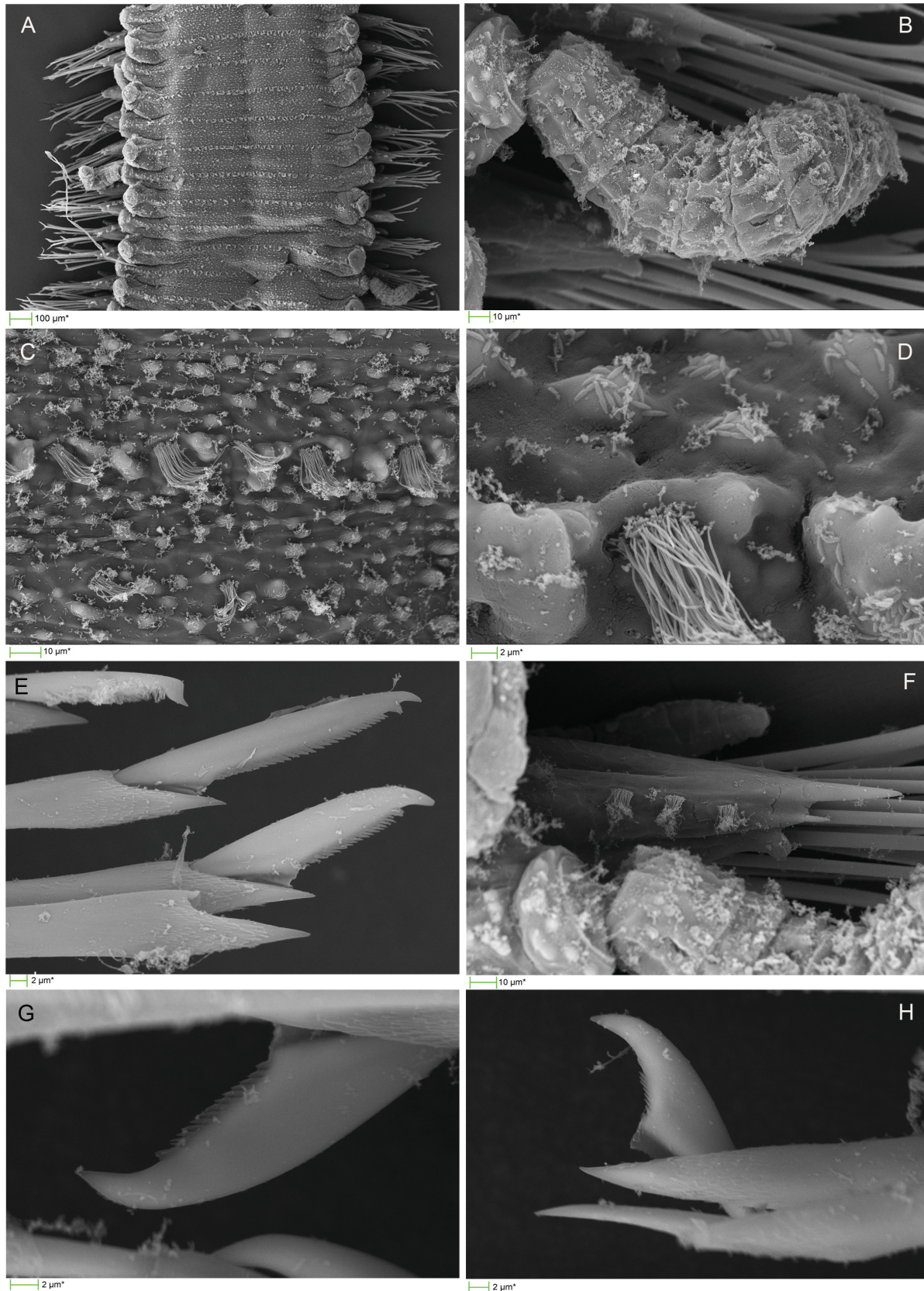


FIGURE 8. SEM. *Trypanosyllis* sp. 2. AM W.47226. A. Mid-body chaetigers, dorsal view; B. Dorsal cirrus, mid-body chaetiger; C. Detail of dorsal surface with papillae and tufts of cilia, mid-body chaetigers; D. Detail of tuft of cilia; E. Most dorsal chaetae, anterior chaetiger; F. Mid-body parapodium, aciculae protruding; G. Most ventral chaeta, mid-body chaetiger; H. Most ventral chaeta, posterior chaetiger.

Genus *Trypanobia* (Imajima & Hartman, 1964) n. comb.

Trypanosyllis (*Trypanobia*) Imajima & Hartman, 1964: 128.

Trypanosyllis (*Trypanobia*).—San Martín *et al.* 2010: 42–43.

Type species. *Haplosyllis depressa* Augener, 1913, designated by Imajima & Hartman (1964).

Diagnosis. (After San Martín *et al.* 2010). Mid- to large-sized body, ribbon-like, strongly dorsoventrally flattened, with numerous short segments. Prostomium with four eyes and three antennae. Palps completely separate, ventrally directed. Two pairs of tentacular cirri. Antennae, tentacular and dorsal cirri distinctly articulated. Pharynx with trepan. Pharyngeal tooth absent. Chaetae all thick, simple; simple capillary chaetae absent.

Remarks. Imajima & Hartman (1964) erected the subgenus *Trypanobia* within *Trypanosyllis* to include species with ribbon-shaped bodies but having only simple chaetae. San Martín *et al.* (2010) maintained this subgenus, though suggested that the differences may be great enough to consider it as an independent genus. Recently, Aguado *et al.* (2015) performed a phylogenetic analysis whose results show species of *Trypanobia* (*T. depressa* and *T. cryptica*) in a monophyletic group, while *Trypanosyllis* species grouped in other non-sister clades. Herein, we propose *Trypanobia* as a genus separate from *Trypanosyllis*, with a geographical distribution restricted to the Pacific Ocean. In addition, *Trypanobia* has a different kind of stolon to *Trypanosyllis*. Stolons in *Trypanosyllis* are acerous or tetraglene (with two pairs of eyes), while in *Trypanobia* they also have two pairs of eyes, ventrally developed, but there is also a pair of small anterolateral appendages (Okada 1933; this study). *Trypanobia* currently includes five species: *T. (T.) depressa* (Augener, 1913) from Australia and Japan, *T. ankyloseta* Day, 1960 from South Africa (Day 1960), *T. (T.) asterobia* Okada, 1933 from Japan (Imajima 1966), *Trypanobia (T.) foliosa* Imajima, 2003 from Japan and Australia (the latter with doubts *sensu* San Martín *et al.* 2010), and an additional species described herein, *Trypanobia cryptica* n. sp. *Trypanobia depressa* and *Trypanobia cryptica* n. sp. live in association with bright red sponges. The live specimens have exactly the same colour pattern as their hosts.

Additionally, there are two species, *Trypanosyllis inglei* Perkins, 1980 and *Trypanosyllis* sp. (Çinar 2007) with two kinds of chaetae: simple (where fusion between blade and shaft is apparent), and compound (with shafts and falcigers). Their relationship with *Trypanosyllis* and *Trypanobia* needs further phylogenetic study.



FIGURE 9. *Trypanobia depressa* AM W.41535. A–B. Mid-body chaetigers, simple chaetae; C. Anterior end, dorsal view; D. Mid-body chaetigers, ventral view. Scale bars: A= 42 µm; B= 77 µm.

***Trypanobia depressa* (Augener, 1913)**

(Figs 9, 10)

Haplosyllis depressa Augener, 1913: 216, pl. 3, figs 29, 30, text-figs 27a, b.

Trypanosyllis (Trypanobia) depressa.—Imajima 1966b: 242, figs 46 a–f; 2003: 160; San Martín *et al.* 2008b: 43–45, fig. 5.

Material examined. AM W.41259 (3, 1 on SEM stub), Lizard Island, High Rock, 14°49'27"S, 145°33'10"E, red sponge, 10 m, 11 Sep 2010, CReefs; AM W.41535, same.

GenBank COI accession number: KR364801.

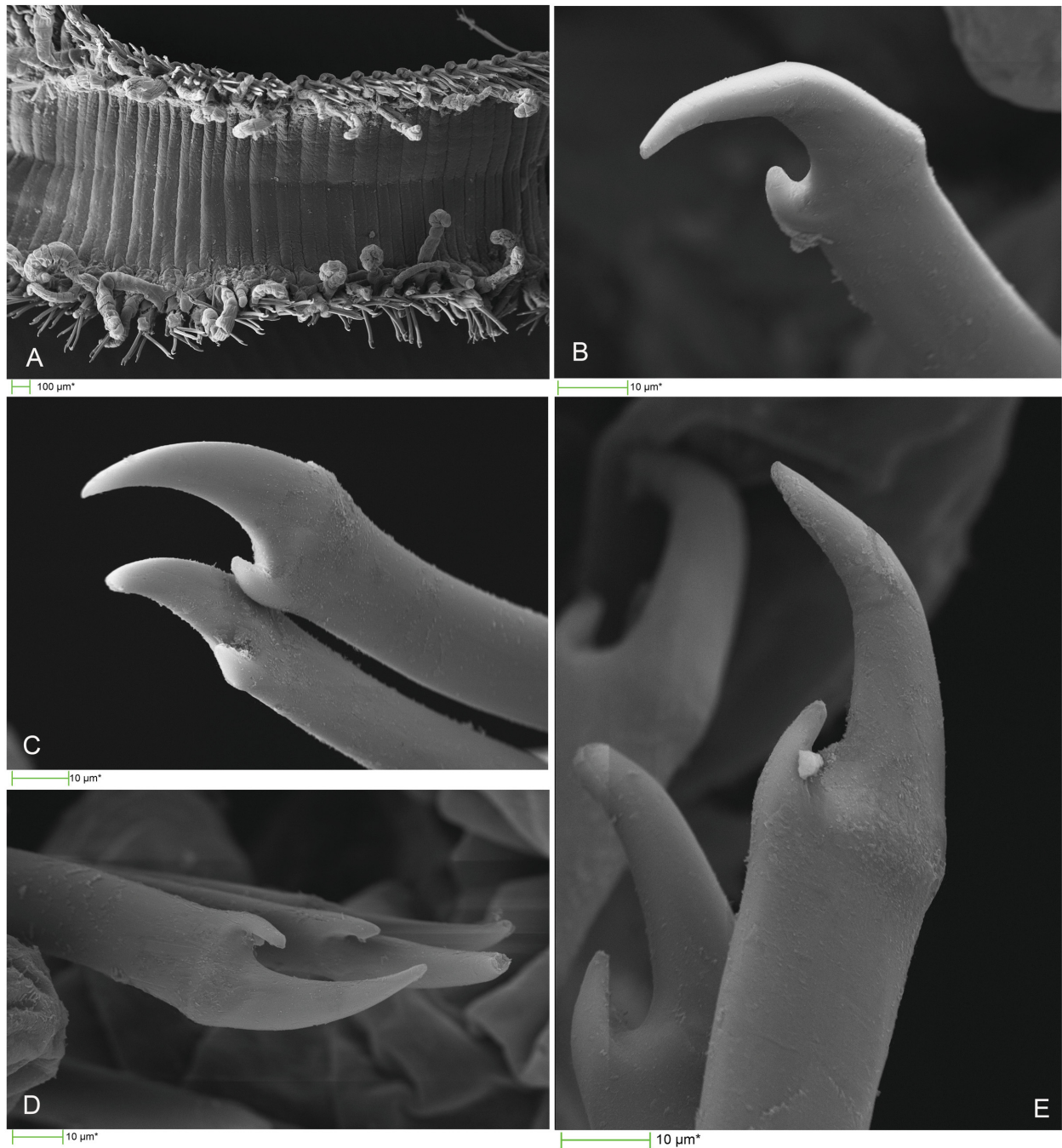


FIGURE 10. SEM. *Trypanobia depressa* AM W.41259. A. Mid-body chaetigers, dorsal view; B–E. Mid-body simple chaetae.

Remarks. The colour pattern could not be checked since fresh material was not collected during the 2013 Lizard Island Polychaete Workshop, and preserved specimens collected in 2010 had lost pigmentation (Figs 9C–D). Dorsum with series of small longitudinal crests on each segment (Fig. 10A), without papillae and cilia. Simple chaetae as described by Imajima (1966) and San Martín *et al.* (2008b) (Figs 9A–B, 10B–E). First report for Queensland.

Habitat. On red sponges, in subtidal depths.

Distribution. Australia (Western Australia, Queensland), Japan.

***Trypanobia cryptica* n. sp.**

(Figs 11, 12, 13)

Material examined. Holotype: AM W.44443, MI QLD 2368, (part on SEM pins, anterior end fixed in 100% ethanol).

GenBank COI accession number: KR534503

Description. Holotype in three fragments; anterior end 1.5 mm wide, 0.4 mm long, with 24 chaetigers; midbody piece 0.5 mm long, with 33 chaetigers; posterior end 1 cm long, with 54 chaetigers, plus one developing stolon of 14 additional chaetigers. Live specimen strongly pigmented with bright red (Figs 11A–B); preserved specimen whitish with reddish glandular material within articles of posterior dorsal cirri. Body strongly dorsoventrally flattened, ribbon-like, with series of longitudinal crests on each segment. Prostomium rounded, bilobed, with four circular red eyes in rectangular arrangement (Fig. 12A). Palps short, ventrally directed, completely separate. Antennae inserted on anterior margin of prostomium; median antenna inserted between anterior pair of eyes, with approximately 10 articles, lateral antennae inserted on anterior margin of prostomium, with approximately 15 articles. Peristomium dorsally reduced; dorsal tentacular cirri longer than antennae, with approximately 20 articles; ventral tentacular cirri about half the length of dorsal ones. Tentacular and dorsal cirri with well developed cirrophores; dorsal cirri relatively short and thick, with approximately 15–20 articles and granular material inside. Posterior dorsal cirri strongly alternating in length and width, longer ones directed dorsally with 17 articles, and shorter ones, laterally directed, with 11 articles. Parapodia with distinct rounded dorsal lobes (Fig. 11H). Ventral cirri conical, not exceeding the length of parapodia. Chaetae similar throughout body, thick, subdistally slightly enlarged, distally unidentate, with basal spur relatively short (Figs 11C–G, 12B, 13A–F). Anterior and midbody parapodia with 4 simple chaetae, two of which are shorter and more dorsally located (Figs 11C, 13C, E). Chaetae reduced in number to 2–3 in posterior parapodia (Fig. 13F). Anterior parapodia with 3–4 aciculae, straight and distally pointed, occasionally protruding from parapodia (Fig. 11I), aciculae decreasing in number to 2 in posterior chaetigers. Pharynx relatively slender, through approximately 10 segments, with a distal trepan surrounded by a crown of soft papillae. Proventricle similar in width to pharynx, slender, through approximately 15 segments.

Stolon. Developing female stolon of 14 chaetigers, full of circular oocytes, still attached to parental body. One pair of red eyes ventrally visible, another pair possibly developing, one pair of small anterolateral appendages developing. Four simple chaetae per segment, same as those of parental body, notochaetae absent.

Remarks. *Trypanobia cryptica* n. sp. possesses strong bright red colouration perfectly matching the colour of the sponge with which it was found in association. The most similar species is *T. asterobia* Okada, 1933; however this species is described with three kinds of chaetae: superiormost are distally falcate ones with a subterminal spur, median chaetae are falcate with a subterminal spur and minute serrations along the cutting margin, and inferior chaetae are distally bent and simple (Okada 1933; Imajima 1966b). *Trypanobia cryptica* n. sp. has only one kind of simple chaetae with a short basal spur that becomes more evident in posterior chaetigers. Additionally, *T. asterobia* was found in association with an asteroid, *Luidia quinaria* von Martens, 1865, and live specimens lacked a distinct colour pattern (Okada 1933). We also provide its COI sequence, essential for future identification when other specimens are eventually found.

Etymology. The specific name makes reference to the cryptic body colour pattern.

Habitat. On red sponges, from 6–9 m depth.

Distribution. Australia (Queensland).

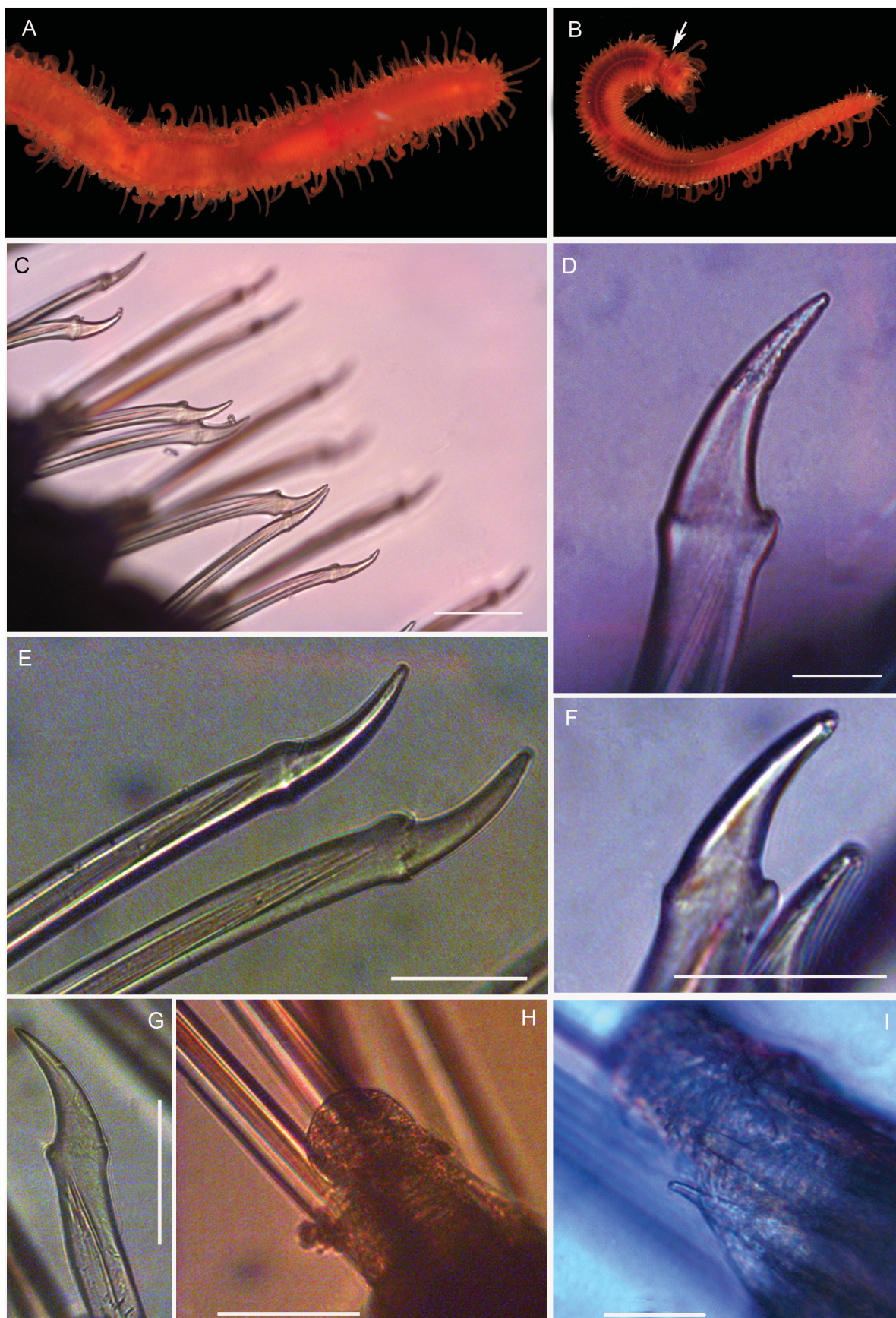


FIGURE 11. *Trypanobia cryptica* n. sp. AM W.44443. A. anterior end, dorsal view; B. Whole specimen, ventrolateral view, arrow pointing attached stolon; C–E Mid-body simple chaetae; F–G. Posterior chaetae; H. dorsal parapodial lobe, midbody chaetiger; I. Mid-body parapodium, aciculae protruding. Scale bars: C = 100 μ m; D = 20 μ m; E–H = 50 μ m; I = 20 μ m.

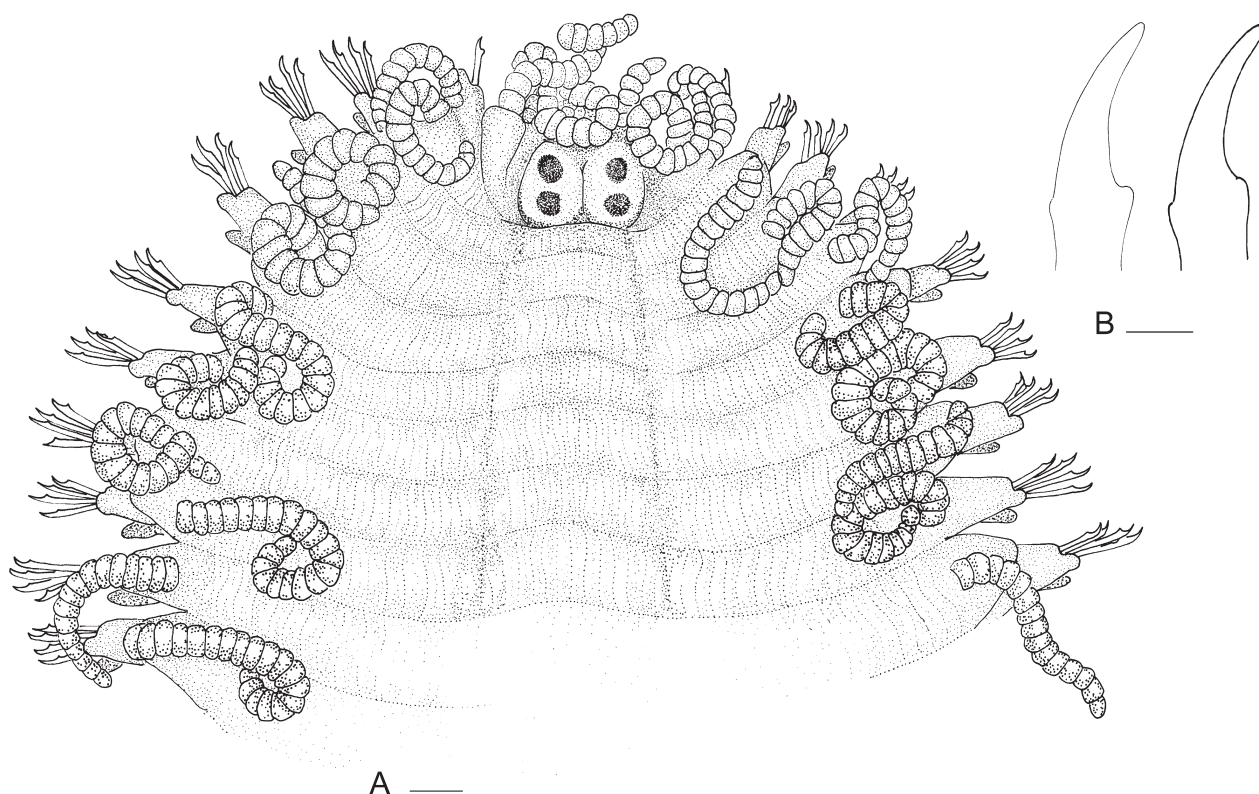


FIGURE 12. *Trypanobia cryptica* n. sp. AM W.44443. A. anterior end, dorsal view; B. Mid-body chaetae. Scale bars: A = 0.1 mm; B = 20 µm.

Genus *Xenosyllis* Marion & Bobretzky, 1875

Xenosyllis Marion & Bobretzky, 1875: 26.

Type species. *Syllis scabra* Ehlers, 1864, by monotypy.

Xenosyllis scabroides San Martín, Hutchings & Aguado, 2008

Xenosyllis scabroides San Martín *et al.*, 2008a: 154–157, figs 30E, F, 31A–E, 32A–F, 33A, B.

Material examined. AM W.45001, MI QLD 2424; AM W.45009, MI QLD 2423; AM W.44725, MI QLD 2413.

Remarks. First report for Lizard Island.

Habitat. Coral rubble, in shallow waters.

Distribution. Australia (north and central Western Australia, Queensland).

Incertae sedis

Genus *Westheidesyllis* San Martín, López & Aguado, 2009

Westheidesyllis San Martín, López & Aguado, 2009: 1492–1493.

Type species. *Eusyllis heterocirrata* Hartmann-Schröder, 1959, by monotypy.

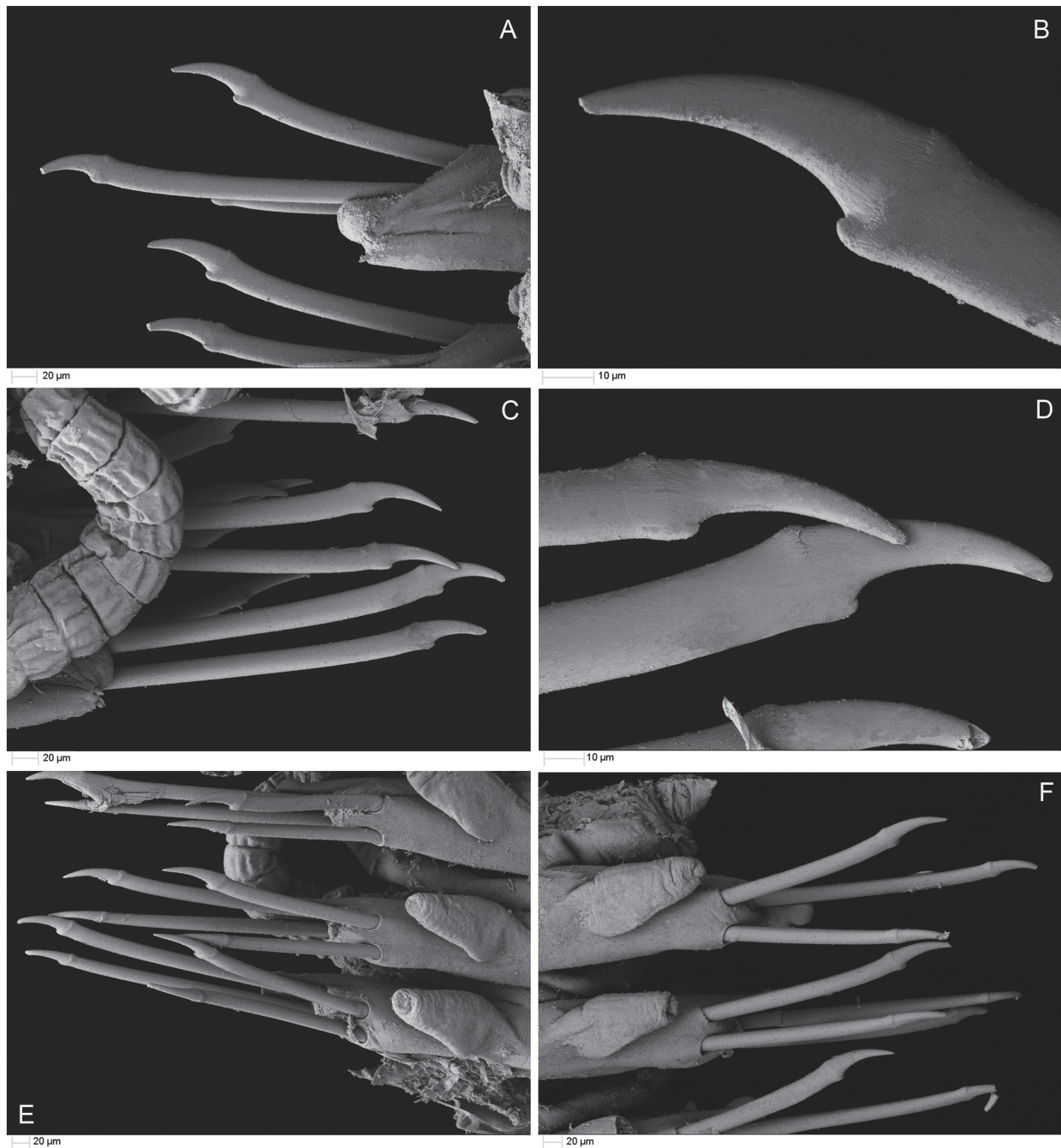


FIGURE 13. SEM. *Trypanobia cryptica* n. sp. AM W.44443. A. Mid-body chaetigers, dorsal view; B. Mid-body chaeta; C. Mid-body chaetigers, dorsal view; D. Mid-body chaetae; E. Mid-body chaetigers, ventral view; F. Posterior chaetigers, ventral view.

***Westheidesyllis corallicola* (Ding & Westheide, 1997)**

Pionosyllis corallicola Ding & Westheide, 1997: 285, fig. 6.

Pionosyllis corallicola.—San Martín & Hutchings 2006: 328–329, figs 59A–E.

Westheidesyllis corallicola.—San Martín, López & Aguado 2009: 1493.

Material examined. AM W.44431, MI QLD 2374 (2).

Remarks. First report for Queensland.

Habitat. Coralline sand, interstitial.

Distribution. China (Hainan Island), Australia (Western Australia, Queensland).

Acknowledgements

We are especially grateful to Alexander Semenov for pictures in colour, Chris Glasby for checking fluorescence properties and pictures of *M. heterosetosa* (Figs 5D, E) and María Paz Molina for her kind help with ancient Greek and Latin to find names for the new species. We would also like to thank María Capa for her help when collecting and processing material, and to Carolina Noreña and Manuela Gallardo for the use of microscopes at the MNCN. This study has been partly supported by a Geddes Visiting Fellowship awarded by the Australian Museum to MTA for visits to the AM and NTM in 2012. Most material was collected during the Polychaete International Workshop held at Lizard Island in 2013, funded by the Lizard Island Research Foundation, during which collections were made under Permit number G12/35718.1 issued by the Great Barrier Reef Marine Park Authority.

References

- Aguado, M.T. & Glasby, C. (2015) Indo-Pacific Syllidae (Annelida) share an evolutionary history. *Systematics and Biodiversity*, 13 (4), 369–385.
<http://dx.doi.org/10.1080/14772000.2014.992379>
- Aguado, M.T., Glasby, C., Schroeder, P., Weigert, A. & Bleidorn, C. (2015) The making of a branching annelid: an analysis of complete mitochondrial genome and ribosomal data of *Ramisyllis multicaudata*. *Scientific reports*, 5 (Article No. 12072).
<http://dx.doi.org/10.1038/srep12072>
- Aguado, M.T., San Martín, G. & Ten Hove, H. (2008) Syllidae (Annelida: Polychaeta) from Indonesia collected in the Siboga (1899–1900) and Snellius II (1984) expeditions. *Zootaxa*, 1673, 1–48.
- Álvarez, P., San Martín, G. & Aguado, M.T. (2012) *Branchiosyllis* Ehlers, 1887 from Philippines islands with the description of one new species. *Zootaxa*, 3542, 49–68.
- Augener, H. (1913) Polychaeta I, Errantia. Die Fauna Südwest-Australiens. *Ergebnisse des Hamburger Südwest-australischen Forschungreise 1905*, 4 (5), 65–304.
- Çinar, M.E. (2007) A new species of *Trypanosyllis* (Polychaeta: Syllidae) from the Levantine coast of Turkey (eastern Mediterranean). *Journal of the Marine Biological Association of the United Kingdom*, 87, 451–457.
<http://dx.doi.org/10.1017/S0025315407054355>
- Çinar, M.E. & Dagli, E. (2012) New records of alien polychaete species for the coasts of Turkey. *Mediterranean Marine Science*, 13, 103–107.
<http://dx.doi.org/10.12681/mms.26>
- Çinar, M.E., Ergen, Z. & Belin, H.A. (2003) Autolytinae and Exogoninae (Polychaeta: Syllidae) from Northern Cyprus (Eastern Mediterranean Sea) with a checklist of species reported from the Levant Sea. *Bulletin of Marine Science*, 72, 741–767.
- Claparède, E. (1863) *Beobachtungen über Anatomie und Entwicklungsgeschichte wirbelloser Thiere an der Küste von Normandie angestellt*. Wilhelm Engelmann, Leipzig, 120 pp.
<http://dx.doi.org/10.5962/bhl.title.10030>
- Claparède, E. (1864) Glanure Zootomiques parmi les Annélides de Port-Vendres (Pyrénées Orientales). *Mémoires de la Société de Physique et d'Histoire Naturelle de Genève*, 17 (2), 463–600.
- Day, J.H. (1960) The Polychaete fauna of South Africa. Part 5. Errant species dredged off Cape coasts. *Annals of the South African Museum*, 45 (3), 261–373.
- Ding, Z. & Westheide, W. (1997) New records and descriptions of tidal and subtidal syllid species (Polychaeta) from the Chinese coast. *Bulletin of Marine Science*, 60 (2), 277–292.
- Ehlers, E. (1864) *Die Borstenwürmer (Annelida Chaetopoda) nach Systematischen und Anatomischen Untersuchungen*. Wilhelm Engelmann, Leipzig, 270 pp.
<http://dx.doi.org/10.5962/bhl.title.2081>
- Ehlers, E. (1887) Report on the annelids of the dredging expedition of the U. S. coast survey steamer “Blake”. *Memoires of the Museum of Comparative Zoology at Harvard College*, 15, 1–335.
- Grube, A.E. (1857) Annulata Örstediana. Enumeratio Annulorum, quae in itinere per Indian occidentalem et Americam centalem annis 1845–1848 suscepto legit cl. A. S. Örsted, adiectis speciebus nonnullis a cl. H. Krøyer in itinere ad Americam meridionalis collectis. *Videnskabelige Meddelelser fra den naturhistoriske Forening, København*, 158–186.
- Hartman, O. (1959) Catalogue of the polychaetous annelids of the world. Parts I, II (1959), and Supplement (1965). *Allan Hancock Foundation Occasional Papers*, 23, 1–828.
- Hartmann-Schröder, G. (1956) Polychaeten-Studien. I. *Zoologischer Anzeiger*, 157, 87–91.

- Hartmann-Schröder, G. (1979) Teil 2. Die Polychaeten der tropischen Nordwestküste Australiens (zwischen Port Samson im Norden und Port Hedland im Süden). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 76, 75–218.
- Hartmann-Schröder, G. (1980) Teil 4. Die Polychaeten der tropischen Nordwestküste Australiens (zwischen Port Samson im Norden und Exmouth im Süden). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 77, 41–110.
- Hartmann-Schröder, G. (1981) Teil 6. Die Polychaeten der tropisch-subtropischen Westküste Australiens (zwischen Exmouth im Norden und Cervantes im Süden). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 78, 19–96.
- Hartmann-Schröder, G. (1982) Teil 8. Die Polychaeten der subtropischen-antiborealen Westküste Australiens (zwischen Cervantes im Norden und Cape Naturaliste im Süden). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 79, 51–118.
- Hartmann-Schröder, G. (1983) Teil 9. Die Polychaeten der antiborealen Südwestküste Australiens (zwischen Dunsborough im Norden und Denmark im Süden). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 80, 123–167.
- Hartmann-Schröder, G. (1984) Teil 10. Die Polychaeten der antiborealen Südküste Australiens (zwischen Albany im Westen und Ceduna im Osten). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 81, 7–62.
- Hartmann-Schröder, G. (1985) Teil 11. Die Polychaeten der antiborealen Südküste Australiens (zwischen Port Lincoln im Westen und Port Augusta im Osten). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 82, 61–99.
- Hartmann-Schröder, G. (1986) Teil 12. Die Polychaeten der antiborealen Südküste Australiens (zwischen Wallaroo im Westen und Port MacDonnell im Osten). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 83, 31–70.
- Hartmann-Schröder, G. (1987) Teil 13. Die Polychaeten der antiborealen Küste von Victoria (Australien) (zwischen Warrnambool im Westen und Port Welshpool im Osten). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 84, 27–66.
- Hartmann-Schröder, G. (1989) Teil 14. Die Polychaeten der antiborealen und subtropisch-tropischen Küste Südost-Australien zwischen Lakes Entrance (Victoria) im Süden und Maclean (New South Wales) im Norden. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 86, 11–63.
- Hartmann-Schröder, G. (1990) Teil 15. Die Polychaeten der subtropisch-tropischen und tropischen Ostküste Australiens zwischen Lake Macquarie (New South Wales) im Süden und Gladstone (Queensland) im Norden. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 87, 41–87.
- Hartmann-Schröder, G. (1991) Teil 16. Die Polychaeten der subtropisch-tropischen bis tropischen Ostküste Australiens zwischen Maclean (New South Wales) und Gladstone (Queensland) sowie von Heron Is (Grobes Barriere-Riff). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 88, 17–71.
- Imajima, M. (1966a) The Syllidae (Polychaetous Annelids) from Japan. III. Eusyllinae. *Publications of the Seto Marine Biological Laboratory*, 14 (2), 85–116.
- Imajima, M. (1966b) The Syllidae (Polychaetous Annelids) from Japan. (V). Syllinae (2). *Publications of Seto Marine Biological Laboratory*, 14 (4), 253–294.
- Imajima, M. & Hartman, O. (1964) *The polychaetous annelids of Japan. Pt. 1. Allan Hancock Foundation Publications Occasional Papers*, 26, 1–452.
- Lattig, P., Martin, D. & San Martín, G. (2010) Syllinae (Syllidae: Polychaeta) from Australia. Part 4. The genus *Haplosyllis* Langerhans, 1879. *Zootaxa*, 2552, 1–36.
- Langerhans, P. (1879) Die Wurmfauna von Madeira [part I]. *Zeitschrift für wissenschaftliche Zoologie*, 32 (4), 513–592.
- Lee, J.W. & Rho, B. (1994) Systematic Studies on Syllidae (Annelida, Polychaeta) from the South Sea and the East Sea in Korea. *Korean Journal of Systematic Zoology*, 10 (2), 131–144.
- Licher, F. (1999) Revision of Gattung *Typosyllis* Langerhans, 1879 (Polychaeta: Syllidae). Morphologie, Taxonomie und Phylogenie. *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft*, 551, 1–336.
- Malmgren, A.J. (1867) Annulata Polychaeta Spetsbergiae Groenlandiae, Islandiae et Scandinaviae hactenus cognita. *Öfversigt af Svenska Vetenskaps Akademiens Förhandlingar*, 24, 1–127.
- Marion, A.F. & Bobretzky, N. (1875) Étude des Annélides du Golfe de Marseille. *Annales des Sciences Naturelles*, 2, 2–46.
- Monro, C.C.A. (1937) Polychaeta. The John Murray Expedition 1933–34. *British Museum (Natural History), Scientific Reports*, 4 (8), 32–321.
- Nygren, A. (2004) Revisión of Autolytinae (Syllidae: Polychaeta). *Zootaxa*, 680, 1–314.
- Okada, Y.K. (1933) Two interesting syllids, with remarks on their asexual reproduction. *Memoirs of the College of Science, Kyoto Imperial University*, Series B, 8, 325–339.
- Örsted, A.E. (1845) Ueber die Entwicklung der Jungen bei einer Annelide und über änderen Untersuchiede zwischen beiden Geschlechtern. *Archiv für Naturgeschichte Berlin*, 11 (1), 20–23.
- Ribas, J. & Hutchings, P. (2015) Lizard Island Polychaete Workshop: sampling sites and a checklist of polychaetes. *Zootaxa*, 4019 (1), 7–34.
<http://dx.doi.org/10.11646/zootaxa.4019.1.4>
- San Martín, G. (1984) Descripción de una nueva especie y revisión del género *Sphaerosyllis* (Polychaeta: Syllidae). *Cahiers de Biologie Marine*, 25, 375–391.
- San Martín, G. (1990). Eusyllinae (Syllidae, Polychaeta) from Cuba and Gulf of México. *Bulletin of Marine Science*, 46 (3), 590–619.

- San Martín, G. (2002) A new genus and species of Syllidae (Polychaeta) from Australia brooding eggs dorsally by means of compound notochaetae. *Proceedings of the Biological Society of Washington*, 115 (2), 333–340.
- San Martín, G. (2003) Annelida Polychaeta II: Syllidae. *Fauna Ibérica*, 21, 1–554. [Museo Nacional de Ciencias Naturales, CSIC, Madrid, Spain]
- San Martín, G. (2005) Exogoninae (Polychaeta, Syllidae) from Australia, with the description of a new genus and twenty-two new species. *Records of the Australian Museum*, 57, 39–152.
<http://dx.doi.org/10.3853/j.0067-1975.57.2005.1438>
- San Martín, G., & Aguado, M.T. (2014) Family Syllidae. In: De Gruyter (Eds.), *Handbook of Zoology, Annelida*. [published online]
- San Martín, G., Aguado, M. & Murray, A. (2007) A new genus and species of Syllidae (Polychaeta) from Australia with unusual morphological characters and uncertain systematic position. *Proceedings of the Biological Society of Washington*, 120 (1), 39–48.
[http://dx.doi.org/10.2988/0006-324x\(2007\)120\[39:angaso\]2.0.co;2](http://dx.doi.org/10.2988/0006-324x(2007)120[39:angaso]2.0.co;2)
- San Martín, G. & Hutchings, P.A. (2006) Eusyllinae (Polychaeta, Syllidae) from Australia with the description of a new genus and fifteen new species. *Records of the Australian Museum*, 58, 257–370.
<http://dx.doi.org/10.3853/j.0067-1975.58.2006.1466>
- San Martín, G., Hutchings, P. & Aguado, M.T. (2008a) Syllinae (Polychaeta, Syllidae) from Australia. Part. 1. Genera *Branchiosyllis*, *Eurysyllis*, *Karroonsyllis*, *Parasphaerosyllis*, *Plakosyllis*, *Rhopalosyllis*, *Tetrapalpia* n. gen., and *Xenosyllis*. *Records of Australian Museum*, 60 (2), 119–160.
<http://dx.doi.org/10.3853/j.0067-1975.60.2008.1494>
- San Martín, G., Hutchings, P. & Aguado, M.T. (2008b) Syllinae (Polychaeta, Syllidae) from Australia. Part. 2. Genera *Inermosyllis*, *Megasyllis* n. gen., *Opisthosyllis*, and *Trypanosyllis*. *Zootaxa*, 1840, 1–53.
- San Martín, G., Hutchings, P. & Aguado, M.T. (2010) Syllinae (Polychaeta: Syllidae) from Australia. Part 3. Genera *Alcyonosyllis*, *Parahaplosyllis*, and *Trypanosyllis* (*Trypanobia*). *Zootaxa*, 2493, 35–48.
- San Martín, G. & López, E. (2003) A new genus of Syllidae (Polychaeta) from Western Australia. *Hydrobiologia*, 496, 191–197.
http://dx.doi.org/10.1007/978-94-017-0655-1_17
- San Martín, G., López, E. & Aguado, M.T. (2009) Revision of the genus *Pionosyllis* Malmgren, 1867 (Polychaeta, Syllidae, Eusyllinae), with a cladistic analysis, and the description of five new genera and two new species. *Journal of Marine Biological Association of the United Kingdom*, 89, 1455–1498.
<http://dx.doi.org/10.1017/S0025315409003099>
- Watson, C. (2009) A new species of *Clavisyllis* Knox, 1957 (Polychaeta: Syllidae): a genus with the unusual distribution of New Zealand and the Great Barrier Reef, Northern Queensland, Australia. *The Beagle*, 25, 77–84.
- Westheide, W. (1974) Interstitielle Fauna von Galapagos. XI. Pisionidae, Pilargidae, Syllidae. *Mikrofauna Meeresbodens*, 44, 195–338.
- Weigert, A., Helm, C., Meyer, M., Nickel, B., Arendt, D., Hausdorf, B., Santos, S.R., Halanych, K.M., Purschke, G., Bleidorn, C. & Struck, T.H. (2014) Illuminating the base of the annelid tree using transcriptomics. *Molecular Biology and Evolution*, 31, 1391–1401.
<http://dx.doi.org/10.1093/molbev/msu080>